PB86-172517

Superfund Record of Decision (EPA Region 5)
New Brighton/St. Anthony
Ramsey County, Minnesota
(Initial Remedial Measure) August 1984

(U.S.) Environmental Protection Agency
Washington, DC

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EPA/ROD/R05-84/029
August 1984

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EPA

Superfund Record of Decision:

New Brighton/St. Anthony, MN (IRM)

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15. SUPPLEMENTARY NOTES

16. ABSTRACT

The New Brighton/Arden Hills site is located immediately north of Minneapolis/St. Paul, Minnesota. The "site" actually includes portions of the municipalities of Shoreview, Arden Hills, Moundsview, New Brighton and St. Anthony. The site presently consists of more than 18 square miles of ground water contaminated with volatile organics. In June 1981, the Minnesota Pollution Control Agency (MPCA) and the Minnesota Department of Health (MDH) found organic solvent contamination in ground water used for municipal drinking water in the City of New Brighton, which lies immediately to the northeast of St. Anthony and Minneapolis. The original June 1981 sampling showed no contamination in the St. Anthony wells; but by late 1981, unquantifiable traces of trichloroethylene (TCE) contamination began to appear in city well number 3. From 1982 to 1984, TCE levels in well number 3 gradually rose to the 8-10 ppb range with a peak level of 23 ppb. In addition, dichloroethylene (DCE) levels gradually rose to levels averaging approximatley 1 ppb, with a peak of 1.7 ppb.

U.S. EPA installed granular activated carbon filters on two undeepened wells to meet the peak summertime demand and an existing public water supply system was extended to affected private well users as approved in IRMs dated 6/24/83 and 9/19/83. This initial remedial measure will consist of a temporary connection to an existing

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Record of Decision New Brighton/St. Anthony, MN (IRM) Contaminated Media: gw Key contaminants: 1,1-dichloroethane, 1,1-dichloroethylene, Trans-1,2-Dichloroethylene, 1,1,1-trichloroethane, 1,1,2-trichloroethylene		

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Abstract (continued)

public water supply system to replace the contaminated municipal system. Total capital cost for this initial remedial measure is estimated to be $142,090.

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RECORD OF DECISION
INITIAL REMEDIAL ALTERNATIVE SELECTION

Site: New Brighton/Arden Hills, Ramsey County, Minnesota (City of St. Anthony)

Documents Reviewed:

I have reviewed the following documents describing the analysis of the cost-effectiveness of initial remedial action alternatives for the New Brighton/ Arden Hills, Minnesota (City of St. Anthony)

- Focused Feasibility Study, Alternative Screening Temporary Water Supply, St. Anthony, Minnesota, June 27, 1983
- Short-Elliott-Hendrickson, Inc. regarding St. Anthony, Minnesota, Water Supply from Roseville, Minnesota, March 27, 1984
- City of St. Anthony Council Minutes, June 28, 1984
- Letter to St. Anthony from the Minnesota Department of Health, 1983
- Public comments and recommendations
- June 19, 1984 letter from St. Anthony to MPCA stating bids for construction of the interconnection were higher than estimated
- Responsiveness summary

Description of Selected Remedy:

- Provide alternative service for the City's municipal well that was found to have elevated volatile organic contaminants
- Provide noncontaminated water to an area servicing approximately 400 residential customers and a 35-acre commercial area
- Provide a 12" interconnection with the City of Roseville, Minnesota in the vicinity of County Road C and State Trunk Highway 88 and between the corporate limits of St. Anthony and Roseville, Minnesota
- Provide for adequate storage capacity of the water to meet peak demands

Declarations:

Consistent with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), and the National Contingency Plan (40 CFR Part 300), I have determined that providing a temporary interconnection to the City of Roseville is a cost-effective initial remedial measure and provides adequate protection of public health, welfare, and

the environment. The State of Minnesota has been consulted and agrees with the approved remedy. In addition, the action will require future operation and maintenance activities to ensure the continued effectiveness of the remedy.

I have also determined that the action has been approved for funding from the Hazardous Substance Response Trust Fund.

The U.S. EPA is continuing its remedial investigation study of the New Brighton/Arden Hills, Minnesota, site to evaluate potential sources of contamination and the hydraulic characteristics of the aquifer in order to evaluate potential remedial actions. If additional remedial actions are determined to be a necessary, a Record of Decision will be prepared for approval of the future remedial action.

8/2/84
Date

Alan Levin (acting)
Valdas V. Adamkus
Regional Administrator

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Narrative Summary

Site Location and Description

The New Brighton/Arden Hills Superfund National Priorities List site is located immediately north of Minneapolis/St. Paul, Minnesota. This "site" actually includes portions of the municipalities of Shoreview, Arden Hills, Moundsview, New Brighton, and St. Anthony, Minnesota. A portion of the City of Fridley may also be involved.

The City of St. Anthony consists of approximately 8,000 residents according to 1980 census figures. The City is virtually 100% developed and no major developments affecting the population or housing trends is anticipated. The area is primarily residential with some small industrial businesses.

The City of St. Anthony obtains their water supply from three municipal water wells (Well Numbers 3, 4, and 5). This groundwater is distributed to the City of St. Anthony without softening. The distribution system consists of 6", 10" and 12" water mains, two storage units, and a filtration plant. The storage units include a 250,000-gallon elevated tank which pressurizes the distribution system and a 2-million gallon ground storage reservoir. Water is pumped from the wells to the ground storage reservoir and then to the elevated storage and distribution system. The discharge from Wells Nos. 3 and 4 are mixed before entering the City water mains (see map showing well locations).

History

In June 1981, the Minnesota Pollution Control Agency (MPCA) and the Minnesota Department of Health (MDH) found organic solvent contamination in the groundwater used for municipal drinking water in the City of New Brighton, Minnesota, which lies immediately to the northeast of St. Anthony, Minnesota, and Minneapolis, Minnesota. This site presently consists of more than approximately 18 square miles of groundwater contaminated with volatile organic contaminants. In 1983, the MPCA and the U.S. EPA entered into a State-lead cooperative agreement to conduct a two-phase remedial investigation (RI) of this site to determine the extent of the contamination and to determine the source(s) of the contamination. The cooperative agreement also included a focused feasibility study (FFS) to evaluate alternative water supplies in three areas of the site while the long-term RI is underway. These areas are:

1. New Brighton Wells Numbers 5 and 6
2. Private Wells in the Arden Hills area
3. St. Anthony Wells

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In 1982 after the MDH advised the City of New Brighton to find an alternative noncontaminated water supply, the City deepened two municipal wells. An emergency request submitted to U.S. EPA was denied. Since discovery, the contamination levels have increased in the remaining undeepened municipal wells. The City of New Brighton had also drilled two new additional deeper wells. Although this program progressed as fast as possible, these new wells were not available until the fall of 1983. Through an Initial Remedial Measure (IRM), the U.S. EPA had installed granular activated carbon filters on two undeepened wells to meet the peak demands of the summertime.

Several private wells in the New Brighton/Arden Hills area were contaminated with excessive levels of volatile organic compounds. Since most of these private wells were located in very close proximity to the southwest corner of the Twin Cities Army Ammunition Plant (TCAAP), a potentially responsible party, the Department of Defense agreed to supply these private well users with bottled water until the implementation of the FFS alternative could be accomplished. This alternative was a pipeline extension to the private well users through a State-lead IRM in 1983.

The original June 1981 sampling showed no contamination in the St. Anthony wells; but by late 1981, unquantifiable traces of trichloroethylene (TCE) contamination began to appear in city Well Number 3, although at concentrations less than currently accepted MDH standards. During 1982, 1983 and 1984, TCE levels in well number 3 gradually rose to 8-10 parts per billion (ppb) range with a peak level of 23 ppb. Dichloroethylene (DCE) levels in 1982, 1983 and 1984 gradually rose to levels averaging approximately 1 ppb, with a peak of 1.7 ppb. Preliminary indications are that the contamination is moving in a northeast to southwest direction. A FFS was done by the U.S. EPA zone contractor, CH_2M-Hill, in 1983 and since only very low to trace levels of contamination were detected in St. Anthony, no IRM was implemented at that time. Since 1983, the MPCA, in close coordination with the City of St. Anthony, has engaged the consulting engineering firm of Short-Elliott-Hendrickson, Inc., to do a FFS for temporary and permanent water service for the City of Roseville, Minnesota. This was completed on March 27, 1984. The MDH, MPCA, and the City of St. Anthony have closely monitored the contaminants in the municipal water wells for the past several months. In late 1983, the City of St. Anthony closed Well #3. On June 1, 1984, the MPCA formally applied to the U.S. EPA for implementation of the St. Anthony selected alternative of a temporary water connection to the City of Roseville as an IRM.

Several studies and investigations have been conducted or are underway in the area:

The MPCA, in close coordination with the U.S. EPA, is investigating potential sources of the contamination, and has tentatively identified the Twin Cities Army Ammunition Plant (TCAAP), Honeywell (a leasee on the TCAAP property), and Butcher's Spur as possible sources of the volatile hydrocarbons.

The Department of Defense (DOD), in conjunction with Honeywell are doing a study on the TCAAP base. Recent Remedial Investigation studies done by the DOD and Honeywell, Inc., on the TCAAP base have shown that there is a TCE problem at two Honeywell leased buildings and from disposal areas and pits on the TCAAP base. Also, TCE may be slowly leaching from these disposal pits into lower geological units. Pressure testing by DOD of several sewer lines coming from the TCAAP property and extending several miles into New Brighton shows that there are leaks in these sewer lines. These sewer lines are force mains. In addition, the DOD has a present plan to clean on-base sewer lines which includes removing hazardous sludges from them.

Shallow monitoring wells around Butcher's Spur show high levels of contaminants (TCE, xylene, etc.). Further investigation of this site's impact on the areawide problem is underway, although the investigation by the involved companies is not deemed adequate at this time by the MPCA or by the U.S. EPA.

The U.S. EPA Field Investigation Team, in close cooperation with the MPCA, identified and sampled approximately 150 private wells in the New Brighton/ Arden Hills/Shoreview area for volatile organic analysis as a preliminary study to the RI.

The U.S. EPA Field Investigation Team has conducted an areawide search of the area reviewing 400-plus companies in an attempt to identify other potentially responsible companies as a preliminary study to the RI. The MPCA is still reviewing the draft of this report.

The New Brighton/Arden Hills Site, Minnesota, was listed as a National Priorities List in Group I on July 1982 listing with a MITRE score of 59.16.

The U.S. Geological Survey (USGS) conducted a seismic survey to attempt to determine the location of buried bedrock valleys, since it is believed that the bedrock valleys would influence contamination flow routes.

The U.S. EPA, in conjunction with the State of Minnesota, is presently involved in a two-phased remedial investigation in order to determine the extent of the contamination plume and to identify the source(s) of the contamination.

The MDH has conducted, with the MPCA and the City of St. Anthony, a joint testing program of the affected municipal wells.

Current Site Status

Five volatile organic chemicals (VOC's) have been consistently found in the well field of St. Anthony. These organics are suspected carcinogens. The City of St. Anthony and the MDH have been monitoring these wells since 1981. Increasing trends can be seen during this time period. Two wells have been sampled at the tap: the Fire Station and the Public Works Building. These facilities are located at the north and south areas of the town. The highest levels of 1,1-DCE found at the well head of Well Number 3 is 1.7 ppb, and the highest level of 1,1-DCE found at the tap is 0.5 ppb. Table 1 lists the contaminants and associated health risks levels.

On February 29, 1984, the MDH, through its jurisdiction over public water supplies, advised the City of St. Anthony to discontinue use of Well Number 3. This was because of unacceptable and rising levels of contaminants. It is suspected that, due to the construction of Well Number 3, the past analytical results, and the apparent affect of Well Number 3 on Wells Numbers 4 and 5, Well Number 3 should no longer be used. Groundwater flow toward Well Number 3 may jeopardize Well Number 4 by drawing more contaminants toward Well Number 4.

Wells Numbers 4 and 5 have shown a very low or nondetectable level of contamination as of February 29, 1984.

The City of St. Anthony's water production capacity has been cut by approximately one-third. Well Number 3 has a capacity to pump 1.66-million gallons per day, but usually has an average volume of 1 million gallons per day. Water conservation measures will be implemented by the City in order to conserve water. It is believed by city staff that such conservation measures will not provide sufficient relief to make up for the loss of Well Number 3, and that additional water supplies will be necessary. This is especially true in the event of failure of standby Well Number 5 and during the hot summer months. The following is a table of water records (1974 through 1983) showing average and maximum water usage for the City of St. Anthony's total water needs:

Time Increment	Average*	Maximum*
Yearly	424	505 (1976)
Monthly	35	90 (July, 1976)
Daily	1.2	3.3 (June 9, 1976)

* in millions of gallons

To date, all the municipal wells both in New Brighton and St. Anthony that have shown high levels of contaminants have been Prairie-du-Chien wells or

TABLE I
Contaminant Characteristics

Contaminant of Concern	Highest Observed Concentration (ug/l) At Well	At Tap	Long-term Health Advisory	Cancer Risk (ug/l) 10-6
1,1-Dichloroethane (1,1-DCA)	0.6 (Well 3)	0.2	----	----
1,1-Dichloroethylene (1,1-DCE)	1.7 (Well 3)	0.5	----	0.033
Trans-1,2-Dichloroethylene (1,1-DCE-trans)	0.85 (Well 5)	less than 0.2	----	----
1,1,1-Trichloroethane (1,1,1-TCA)	4.9 (Well 3)	2.7	----	----
1,1,2-Trichloroethylene (1,1,2-TCE)	23 (Well 3)	13	75	2.7

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Prairie-du-Chien/Jordan wells. The Prairie-du-Chien/Jordan aquifer supplies 75% of the groundwater pumped in the Twin Cities metropolitan area. The Prairie-du-Chien Formation is dolomite of high permeability due to fractures, joints, and solution cavities. The Jordan Formation is thought to be consisted of mostly sandstone. Municipal wells that are in the Jordan aquifer do not show high levels of contamination. However, the Prairie-du-Chien and the Jordan are believed to be connected in some areas. St. Anthony operates 3 wells:

Well Number	Depth (feet)	Aquifer
3*	539	Prairie du Chein (dolomite)-Jordan (sandstone)
4	541	Jordan (sandstone)
5	472	Jordan (sandstone)

* Well Number 3 presently shows contamination with TCE and DCE.

To approximately assess the currently known situation, the contaminants in the Prairie du Chien aquifer seem to be moving in a southwestern direction with TCE contamination extending approximately 2 miles southwest of the St. Anthony well field. It is believed that the location, construction and pumping of Well Number 3 has resulted in contaminant migration towards Wells Numbers 4 and 5 due to gradient modification in the producing aquifer according to Paul Goodreau, Hydrologist, MPCA.

Enforcement

Initially, current Federal enforcement activities are focused on 12 identified potentially responsible parties (PRP's): Butcher's Spur area, Honeywell, Federal Cartridge Corporation, possibly Donovan Construction Company, and Department of Defense. The DOD has agreed to do an on-base study at TCAAP, but has refused, to date, to go offbase for any RI studies except to test their various sewer lines that extend beyond the base for about 5 or 6 miles.

The State enforcement activities have included requests to the Army, Honeywell, 3-M, and Butcher's Spur parties for information related to disposal activities. In addition, requests for response action (RFRA) have been issued by the MPCA board to the Army, Federal Cartridge Corporation, and Honeywell, whom the MPCA believes to be potentially responsible parties. MPCA staff have also requested that the Butcher's Spur parties investigate the solvent contamination identified

on their property without release of liability. In the near furture, information requests will be sent to additional potentially responsible parties, both on and off base. RFRA's will be issued in the future as appropriate.

Alternatives Evaluation

According to City of St. Anthony officials, Well Number 3 had been drilled and cased to approximately 300 feet and then blasted to provide an opening for the water to be obtained from the ground. Therefore, this well has a mix of Prairie du Chien/Jordan water. However, Wells Numbers 4 and 5 have been cased to approximately 450 feet and were not blasted. Wells Numbers 4 and 5 are primarily obtaining their water from the Jordan aquifer. It is presently thought by the City of St. Anthony that continued pumping of Well Number 3 will eventually pull contaminants toward Wells Numbers 4 and 5, which presently have very low to nondetected contaminants in them.

During the initial phase of the feasibility studies, remedial options were screened. Seven alternatives were considered. Table 2 summarizes these options and presents the results of screening of these alternatives based on: 1) ability to protect human health; 2) time required for implementation; 3) relative cost; 4) complexity of alternative; 5) environmental impact of the alternative; and 6) community impact. After screening, four alternatives were recommended for further consideration, and these were:

1) Temporary tie-in to the City of Roseville - Preliminary calculations indicate that the City of Roseville could easily supply St. Anthony at average regional flow rates without a booster pump. The City of Roseville obtains their water from the City of St. Paul at $0.54/1,000 gallons.

2) Temporary tie-in to the City of Columbia Heights - The City of Columbia Heights has indicated that they could supply water to the City of St. Anthony on a temporary basis. The City of Columbia Heights obtains their water from the City of Minneapolis at $1.26/1,000 gallons.

3) Air Stripping of the present well in use - This could be done by either diffused aerators bubbling air through the water or by aerating towers which the water cascades down. However, air stripping will not always remove completely all the contaminants of concern and heating will be required during the winter months.

4) Granular Activated Carbon (GAC) of the present well in use - Adsorption units operated in series that allows each adsorption vessel to remain on-line until the activated carbon reaches its capacity, after which it must be replaced. However, the operation and maintenance (O & M) are very high (over $100,000/year).

Alternative	Ability to Protect Public Health	Time Required to Implement	Relative Costs (*No O&M inc.)	Complexity	Environmental Impact	Comm. Impact	Result of Screening
Do Nothing	Poor	Immediate	None	None	High	High	Eliminated
Water Conservation	Moderate	Immediate	None	Low	High	Moderate to High (Seasonal)	Eliminated
Deeper Existing Wells	Good	6-12 months	$100,200*	High	Low	Moderate	Eliminated
Develop New Wells	Good	10-15 months	$294,200*	High	Low	High	Eliminated
Temporary Tie-in to City of Roseville	Good	2-3 months	$142,090	Moderate	Low	Low	Consider Further
Temporary Tie-in to City of Columbus Heights	Moderate	2-3 months	$330,600 or $358,800 (depending on where connection is made)	Moderate	Low	Moderate	Consider Further
In-line tx of St. Anthony Well Air Stripping	Moderate	2-3 months	$284,500	Moderate	Moderate	Moderate	Consider Further
Gran Act. Carbon	Good	2-3 months	$292,600	Moderate	Low	Moderate	Consider Further

Public Input

On June 28, 1983, at 7:30 p.m., a public meeting was held in coordination with the City of St. Anthony's City Council meeting. The meeting took place in the City of St. Anthony. There were about 30 people in attendance. At this meeting, the no-action alternative was recommended for the present time, since the contaminants in the water supply system were low to trace levels. However, the CH_2M-Hill focused feasibility study for St. Anthony was presented as a preliminary study of which alternatives were available to the City, should it become necessary to implement measures for a noncontaminated water supply. Immediately to the north of St. Anthony is the City of New Brighton which has been experiencing some contaminant in their municipal wells. The CH_2M-Hill study recommended four alternatives after a preliminary screening. A final recommendation of a temporary tie-in to the City of Roseville was viewed in the CH_2M-Hill report as the most cost-effective, temporary water supply source. Copies of this CH_2M-Hill report were made available to the public in the City offices and at the St. Anthony library. City council members also were supplied with their own copies. No comments were received from the general public at this time.

Since June of 1983, the City of St. Anthony has made an engineering study to determine if a permanent or temporary connection to Roseville would be reliable, feasible, and cost-effective. The alternative selected was a temporary connection to the City of Roseville.

On June 20, 1984, a public meeting was held at the City of St. Anthony City Council's office in St. Anthony. The selected alternative chosen by the City of St. Anthony was presented along with the other alternatives considered. Copies of the focused feasibility study from CH_2M-Hill and the study done by the City of St. Anthony were made available at the St. Anthony library and at the MPCA offices.

Recommended Alternative

Section 300.68(j) of the National Oil and Hazardous Substances Contingency Plan (NCP), 40 CFR, states that the appropriate extent of remedy shall be determined by the lead agency's selection of the remedial alternative which the agency determines is cost-effective (i.e., the lowest cost alternative that is technologically feasible and reliable) and which effectively mitigates and minimizes damage to and provides adequate protection of public health, welfare, or the environment. Based on our evaluation of the cost-effectiveness of each of the proposed alternatives, any comments received from the public (none received) and the City Council of St. Anthony, information from the state, and information from the feasibility studies done to date, Alternative 1 has been selected and developed. This alternative is the temporary connection to the City of St. Anthony. The City

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of St. Anthony did an engineering study to determine if a permanent or temporary connection would be feasible and cost-effective. Based on the City's study, the temporary connection would be more cost-effective. Cost-estimates for temporary water service was approximately $150,000, and cost-estimates for a permanent water service was approximately $170,000. City officials of St. Anthony stated that the City of Roseville had concerns if the permanent alternative was chosen, a study of the Roseville water supply lines would need to be done to assure that the connection would not disturb the present water system in place presently (see June 21, 1984, statement from the St. Anthony Public Works Director).

Schedule

Approve Remedial Action (sign ROD)	7/10/84
Award Superfund State Contract for Construction	7/15/84
Complete Design	Completed using MPCA Superfund monies
Start Construction	7/15/84
Complete Construction	7/30/84

Future Actions

A two-phased remedial investigation is underway presently. Phase I is expected to be completed this year. Phase II is expected to be completed next year.

The DOD is conducting a remedial investigation/feasiblity study for the TCAAP base only. The DOD draft phase II and III are available for comment presently. Negotiations with the DOD are presently underway.